

## CLAIMS

1. An image coding apparatus for coding a plurality of images data corresponding respectively to a plurality of viewpoints, comprising:

a joining method selecting means for selecting a joining method when the plurality of images data are joined;

a joining means for joining the plurality of images data based on the joining method selected by the joining method selecting means;

a coding means for coding a joined image data; and

a joining method coding means for coding information of the selected joining method.

2. The image coding apparatus according to Claim 1, further comprising a sub-sampling means for sub-sampling the plurality of images data to output a resultant to the joining means.

3. The image coding apparatus according to Claim 2, wherein a plurality of the sub-sampling means are provided respectively for the plurality of viewpoints.

4. The image coding apparatus according to Claim 1, 2 or 3, further comprising a control means that determines a frame for which the joining method is selected and controls the

joining method selecting means so as to select the joining method for the determined frame only.

5        5.     The image coding apparatus according to Claim 4, wherein the control means controls the joining method coding means so as to code the information of the joining method for the determined frame only.

10       6.     The image coding apparatus according to Claim 1, 2 or 3, further comprising a shift quantity calculating means for calculating a shift quantity by which part of images is shifted relative to the other images when the plurality of images data are joined based on the information of the joining method selected by the joining method selecting means, wherein the  
15       joining method coding means encodes data of the shift quantity together with the information of the joining method.

20       7.     An image decoding apparatus for decoding coded data of joined image data and joining method information, the joined image data being formed by joining a plurality of images data corresponding respectively to a plurality of viewpoints in a predetermined joining method, comprising:

25           a decoding means for decoding the joined image data;  
            a joining method decoding means for decoding the joining method information; and

a display data generating means for generating display data using a decoded image data and a decoded joining method information.

5        8.    The image decoding apparatus according to Claim 7,  
         wherein the decoding means determines a specific frame to  
         be decoded and the joining method decoding means decodes the  
         joining method of the determined frame.

10       9.    The image decoding apparatus according to Claim 7,  
         wherein the joining method decoding means decodes a shift  
         quantity by which part of images is shifted relative to the  
         other images and the display data generating means generates  
         the display data using the shift quantity.

15       10.   An image coding apparatus for coding a plurality of images  
         data corresponding respectively to a plurality of viewpoints,  
         comprising:

         a joining means for joining the plurality of images data  
20       based on a predetermined joining method;

         a coding means for coding a joined image data; and

         a 2-dimensional display image generating method coding  
         means for coding a method of generating a 2-dimensional display  
         image from the joined image data.

25

11. The image coding apparatus according to Claim 1, 2, 3, 4, 5 or 6, further comprising a 2-dimensional display image generating method coding means for coding a method of generating a 2-dimensional display image from the joined image data.

12. The image coding apparatus according to Claim 11, further comprising a 2-dimensional display image generating method selecting means for selecting the method of generating the 2-dimensional display image from the joined image data, disposed on an upstream of the 2-dimensional display image generating method coding means.

13. An image decoding apparatus for decoding coded data of joined image data and 2-dimensional display image generating method information, the joined image data being formed by joining a plurality of images data corresponding respectively to a plurality of viewpoints, in a predetermined joining method, comprising:

a decoding means for decoding the joined image data;  
a 2-dimensional display image generating method decoding means for decoding the 2-dimensional display image generating method information; and

a 2-dimensional display image generating means for generating a 2-dimensional display image, using a decoded

image data and a decoded 2-dimentional display image generating method information.

14. The image decoding apparatus according to Claim 7, 8  
5 or 9, further comprising:

a 2-dimentional display image generating method decoding means for decoding 2-dimentional display image generating method information; and

instead of the display data generating means,

10 a 2-dimentional display image generating means for generating a 2-dimensional display image, using the decoded image data, the decoded joining method information and a decoded 2-dimentional display image generating method information.

15 15. The image decoding apparatus according to Claim 13 or 14, wherein the 2-dimensional display image is a miniaturized image for displaying a plurality of the joined images data in a menu representation.

20 16. A recording medium for storing a plurality of coded images data corresponding respectively to a plurality of viewpoints, together with header information, in a predetermined format, wherein the header portion stores stereo image identification  
25 information that represents the fact that the coded data

constitutes a stereo image made up of a plurality of images data and information that represents a joining method of joining the plurality of images data.

5        17. The recording medium according to Claim 16, wherein, when the coded data represents a stereo image, the header portion further stores information indicating a method of generating a 2-dimentional display image from the coded data.

10       18. The recording medium according to Claim 16 or 17, wherein the header portion is repeatedly multiplexed to the coded data.

15       19. The image decoding apparatus according to Claim 7, 8, 9, 13, 14 or 15, further comprising a display means capable of switching between a stereo representation and a 2-dimentional representation.

20       20. The image decoding apparatus according to Claim 19, wherein automatic switching is done between the stereo representation and the 2-dimentional representation, based on the information stored in the header portion.

25       21. An image recording apparatus for recording a plurality of images data corresponding respectively to a plurality of

viewpoints, into a predetermined recording area, comprising:

a joining means for joining the plurality of images data using a predetermined joining method; and

a joining method coding means for coding information of the joining method,

wherein the recording area includes:

an image recording sector for recording a joined image data or a 2-dimentsional image data;

an audio recording sector for recording an audio data;

and

a subcode sector for recording an associated information.

22. An image recording apparatus for recording a plurality of images data corresponding respectively to a plurality of viewpoints, into a predetermined recording area, comprising:

a joining means for joining the plurality of images data using a predetermined joining method; and

a joining method coding means for coding information of the joining method,

wherein the recording area includes an image recording sector for recording a joined image data or a 2-dimentsional image data, and the coded data of the information of the joining method is recorded in the image recording sector.

23. An image recording apparatus for recording a plurality

of images data corresponding respectively to a plurality of viewpoints, into a predetermined recording area, comprising:

a joining means for joining the plurality of images data using a predetermined joining method; and

5 a joining method coding means for coding information of the joining method,

wherein the recording area includes an audio recording sector for recording an audio data, and a coded data of the information of the joining method is recorded in the audio recording sector.

10

24. An image recording apparatus for recording a plurality of images data corresponding respectively to a plurality of viewpoints, into a predetermined recording area, comprising:

a joining means for joining the plurality of images data using a predetermined joining method; and

15 a joining method coding means for coding information of the joining method,

wherein the recording area includes a subcode sector for recording an associated information, and a coded data of the information of the joining method is recorded in the subcode recording sector.

20

25. An image recording apparatus for recording a plurality of images data corresponding respectively to a plurality of viewpoints, into a recording area, comprising:

25



a joining means for joining the plurality of images data using a predetermined joining method; and

a 2-dimensional display image generating method coding means for encoding a method of generating a 2-dimensional display image from a joined image data,

wherein the recording area includes:

an image recording sector for recording the joined image data or the 2-dimentsional image data;

an audio recording sector for recording an audio data;

and

a subcode sector for recording an associated information.

26. An image recording apparatus for recording a plurality of images data corresponding respectively to a plurality of viewpoints, into a recording area, comprising:

a joining means for joining the plurality of images data using a predetermined joining method; and

a 2-dimensional display image generating method coding means for encoding a method of generating a 2-dimensional display image from a joined image data,

wherein the recording area includes an image recording sector for recording the joined image data or a 2-dimentsional image data, and a coded data of information of generating the 2-dimensioal display image is recorded in the image recording sector.

27. An image recording apparatus for recording a plurality of images data corresponding respectively to a plurality of viewpoints, into a recording area, comprising:

5       a joining means for joining the plurality of images data using a predetermined joining method; and

      a 2-dimensional display image generating method coding means for encoding a method of generating a 2-dimensional display image from a joined image data,

10       wherein the recording area includes an audio recording sector for recording an audio data, and a coded data of information of generating the 2-dimensioal display image is recorded in the audio recording sector.

15       28. An image recording apparatus for recording a plurality of images data corresponding respectively to a plurality of viewpoints, into a recording area, comprising:

      a joining means for joining the plurality of images data using a predetermined joining method; and

20       a 2-dimensional display image generating method coding means for encoding a method of generating a 2-dimensional display image from a joined image data,

      wherein the recording area includes a subcode sector for recording an associated information, and a coded data of  
25       information of generating the 2-dimensioal display image is

recorded in the subcode recording sector.